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EXAMINER	
AMINI, JAVID A	

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2672	12

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/640,684	OGAWA, EIJI	
	Examiner	Art Unit	
	Javid A Amini	2672	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 March 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☐ Claim(s) _____ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-28* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Response to Arguments

Applicant's arguments filed March 25, 2004 have been fully considered but they are not persuasive.

- The rejection of claims 1, 3-4, 10-11, 15, 17,18, 24 and 25 under 35 U.S.C. 112 has been removed.
- Applicant on page 15 lines 9-10 argues that the reference fails to teach all of the limitations of the rejected claims. Referring back to the claim languages:

setting said output brightness characteristic so that a rate of change, Col. 16, lines 50-64 the second embodiment of Yamazaki may comprise a brightness adjuster which can be operated by the user of the image display apparatus, thereby controlling the voltage Vref by the brightness adjuster. Thus, the peak luminance can be set in accordance with the ambient brightness at the installation location of the image display apparatus or user tastes. The second embodiment may further comprise an input video signal average luminance detector to control Vref in accordance with the average level of an input luminance signal (to decrease Vref when the average luminance level of an input video signal is high). If the average luminance level of an input video signal is high to increase power consumption, the peak luminance of the image display apparatus can be suppressed. And also See Yamazaki in col. 8 lines 1-8.

which represents a change in a logarithmic value of said output brightness with respect to a change in the value of said input image signal, in a first region of said image signal which is below a boundary value S_a becomes smaller than that in a second region of said input image signal which is above a boundary value S_a; wherein the boundary value S_a between the first

region and the second region is represented by the following equation: $0.05X\,S_{max} \leq S_a \leq 0.30\,X\,S_{max}$ the mentioned limitations is very broad because the Sa covers between 0 to +∞ therefore Yamazaki in col. 7 lines 1-8 discloses limitations within the applicant limitations. The arrangement of setting one of potentials within the change range applied to the second wiring that is closest to the potential applied to the selected first wiring to be almost equal to the potential applied to the unselected first wiring is exemplified in, e.g., the first embodiment. In the first embodiment, the reference potential is 0 V, and the potential applied to the selected first wiring (i.e., row wiring) is -11 V. A potential corresponding to an image signal applied to each second wiring (column wiring) falls within the range of 0 V to 4 V.

Where S_{max} *is the maximum value of the image signal in the output brightness characteristic.* See col. 6, lines 21-34, Assuming that the peak luminance of the display apparatus is L cd/m.sup.2, and the contrast ratio is k, the threshold is set to a potential difference when the luminance (output brightness) reaches L/k cd/m.sup.2. According to the reference, a desirable contrast ratio is 30 or more under use conditions in home. Under darkroom conditions free from any influence of external light, desirable contrast ratio is 100 or more in many cases. For example, if the peak luminance is 300 cd/m.sup.2 and the contrast ratio necessary for a darkroom is 200, a potential difference having a luminance of 1.5 cd/m.sup.2 is set as a threshold. In the viewpoint of contrast, the potential difference between potentials applied by the first and second wirings to an electron-emitting device not required to emit light is desirably the threshold or less.

- Applicant on page 15 line 17-23 argues that the reference Neitzel fails to teach the limitation in the claim for logarithmic transformation. Examiner's reply: Neitzel in fig. 4 illustrates logarithmic transformation by rescaling the item 163 and store them in the

look-up table. The motivation is to apply logarithmic transformation of Neitzel into Yamazaki output/input signals, which are shown in figs. 4 and 6 (the luminance range).

- Applicant on page 16 lines 3-9 argues that the reference Yamazaki determines threshold values for an electron emission device to achieve a certain level of brightness.

  Examiner's reply: The Applicant in claim 1 claims *Sa* is the input image signal and the S_{max} is the output image signal. Now in Yamazaki fig. 4 illustrates T101 as a input video signal that is equivalent to input image signal in applicant's claim language. And T107-108 is equivalent to output image signal of applicant. The threshold values are the conditions, which are set to achieve certain output signal (i.e. the display signal that is luminance, brightness, intensity or quantity of light). Examiner would like to point out by applying the input signal into the electron emission device that produces the output signals.

- Applicant on page 16 lines 10-16 argues that the references do not teach the boundary values between two regions and the particular equation that discloses in claim 1.

  Examiner refers applicant to see Yamazaki'fig. 11, that shown the output signal vs the input signal, and the limitation from 0-11v requires to activate the luminance and the output signal is increasing exponentially, meaning the input signal at (for example15v) 15v produces the maximum out put signal that is the luminance. Therefore the output signal operates between the input signal of 11-15v. A person skilled in the art could easily compare the similarities of mention scenario with the equation in the claim 1.

- Applicant on page 17 comparing the application of the references with applicant's invention. Examiner's reply: The X-ray is one of the applications of the inventions.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 5-7, 12-14, 19-21, and 26-28 rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential elements, such omission amounting to a gap between the elements. See MPEP § 2172.01. The omitted elements are: the limitation in claim 8 "a first portion of the second region becomes greater than that in a second portion of the second region". Now refer to the limitation set in claims 12-14. Since the value of Smax is undefined therefore if a person skilled in the art replaces for example a value10 into Smax the relationship does not hold above argument in claim 8. There should be an element missing in the arguments. Claims 5-7, 19-21 and 26-28 have the same omitted elements.

Allowable Subject Matter

Claims 5-7, 12-14, 19-21, and 26-28 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1. Claims 1-4, 8-11, 15-18 and 22-25 rejected under 35 U.S.C. 103(a) as being unpatentable over Neitzel et al. (hereinafter referred as Neitzel), and further in view of Yamazaki et al. (hereinafter referred as Yamazaki).

2. Claim 1.

As per claim 1, "An image display method, which has an output brightness characteristic in which a logarithmic value of an output brightness becomes smaller as a value of an input image signal becomes larger, for displaying a visible image that said input image signal represents according to said output brightness characteristic, the image display method comprising the step of: setting said output brightness characteristic so that a rate of change, which represents a change in a logarithmic value of said output brightness with respect to a change in the value of said input image signal, in a first region of said image signal which is below a boundary value S_a becomes smaller than that in a second region of said input image signal which is above a boundary value S_a; wherein the boundary value S_a between the first region and the second region is represented by the following equation: $0.05X\ S_{max} \leq S_a \leq 0.30\ X\ S_{max}$, Where S_{max} is the maximum value of the image signal in the output brightness characteristic.", Neitzel et al. hereinafter Neitzel discloses in (col. 5, lines 65-67 and col. 6, lines 1-4) that the individual data words of the data set are corrected and subjected to a logarithmic transformation (block 9), preferably by means of a look-up table, in conformity with the formula $E=\log D/D_0$, where D_0 is a reference does which is derived in known manner from the contents of the image, for example by histogram analysis. Neitzel dose not explicitly specify the boundary conditions (for low and high value of x and y-axis) or (for a low signal value region and an intermediate and high signal

value region of image signal). Yamazaki et al. (Hereinafter referred as Yamazaki) in col. 6, lines 1-50 teaches the boundary conditions and the threshold values.

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Yamazaki into Neitzel because Neitzel discloses a method in (col. 10, lines 59-60) that is only essential that the small image structures (low signal value) have a smaller dynamic range than the large image structures (high signal value) and Yamazaki illustrates in Fig. 11 the voltage of device as increase the brightness (luminance) increase.

The transformation functions required for this purpose can always be derived from the preset contrast and density functions. The user can thus directly preset the contrast and density (or brightness) of the image, Neitzel (col. 3, lines 1-6).

3. Claim 2.

As per claim 2, "wherein said output brightness characteristic is approximately linear over approximately the entire second region", Neitzel teaches in (col. 8, lines 47-48) that a visible image whose density (brightness) is linearly dependent on the output image values A (high signal value). Also,Yamazaki in col. 1, lines 66-67;col. 6, lines 1-46, discloses the threshold setting. Also in Fig. 7, illustrates output characteristic.

4. Claims 3, 4, 17 and 18

The claim languages of these claims are broad, and the reference Neitzel in fig. 2a-e illustrates the maximum and minimum values of the logarithmic value of the out signal.

5. Claim 8.

As per claim 8, "wherein said output brightness characteristic is set so that said change rate in a first portion of the second region of said image signal becomes greater than that in a second

portion of the second region of said image signal", Neitzel teaches in (col. 10, lines 59-60) that is only essential that the small image structures (low signal value) have a smaller dynamic range than the large image structures (high signal value/brightness characteristic). Also, Yamazaki in Fig. 29 illustrates the change rate in the high signal become greater than a set voltage.

6. Claim 9.

As per claim 9, "wherein said output brightness characteristic is approximately linear over approximately the entire second portion of the second region and over approximately the entire first portion of the second region", Neitzel teaches in (col. 8, lines 47-48) that a visible image whose density (brightness) is linearly dependent on the output image values A (high signal value). Also,Yamazaki in col. 1, lines 66-67;col. 6, lines 1-46, discloses the threshold setting. Also in Fig. 7, illustrates output characteristic.

7. Claim 15.

As per claim 15, "In an image display unit, which comprises a brightness circuit having an output brightness characteristic in which a logarithmic value of an output brightness becomes smaller as a value of an input image signal becomes larger, for displaying a visible image that said input image signal represents according to said output brightness characteristic, the improvement wherein said output brightness characteristic in said brightness circuit is set so that a rate of change, which represents a change in the logarithmic value of said output brightness with respect to a change in said input image signal value, in a first region of said image signal which is below a boundary value Sa becomes smaller than that in second region of said input image signal which is above a boundary value Sa; wherein the boundary value S_a between the first region and the second region is represented by the following equation:

$0.05 \text{ X } S_{max} \leq S_a \leq 0.30 \text{ X } S_{max}$, Where S_{max} is the maximum value of the image signal in the output brightness characteristic. ", Neitzel et al. hereinafter Neitzel discloses in (col. 5, lines 65-67 and col. 6, lines 1-4) that the individual data words of the data set are corrected and subjected to a logarithmic transformation (block 9), preferably by means of a look-up table, in conformity with the formula $E=\log D/D_0$, where D_0 is a reference does which is derived in known manner from the contents of the image, for example by histogram analysis. Neitzel dose not explicitly specify the boundary conditions (for low and high value of x and y-axis) or (for a low signal value region and an intermediate and high signal value region of image signal). Yamazaki et al. (Hereinafter referred as Yamazaki) in col. 6, lines 1-50 teaches the boundary conditions and the threshold values. Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Yamazaki into Neitzel because Neitzel discloses a method in (col. 10, lines 59-60) that is only essential that the small image structures (low signal value) have a smaller dynamic range than the large image structures (high signal value) and Yamazaki illustrates in Fig. 11 the voltage of device as increase the brightness (luminance) increase. The transformation functions required for this purpose can always be derived from the preset contrast and density functions. The user can thus directly preset the contrast and density (or brightness) of the image, Neitzel (col. 3, lines 1-6).

8. Claim 16.

As per claim 16, "wherein said output brightness characteristic in said brightness circuit is approximately linear over approximately the entire second value region", Neitzel teaches in (col. 8, lines 47-48) that a visible image whose density (brightness) is linearly dependent on the output

image values A (high signal value). Also,Yamazaki in col. 1, lines 66-67;col. 6, lines 1-46, discloses the threshold setting. Also in Fig. 7, illustrates output characteristic.

9. Claim 22.

As per claim 22, "wherein said output brightness characteristic in said brightness circuit is set so that said change rate in the first portion of the second region of said image signal becomes larger than that in the second portion of the second region of said image signal", Neitzel teaches in (col. 10, lines 59-60) that is only essential that the small image structures (low signal value) have a smaller dynamic range than the large image structures (high signal value/brightness characteristic). Also,Yamazaki in Fig. 29 illustrates the change rate in the high signal become greater than a set voltage.

10. Claim 23.

As per claim 23, "wherein said output brightness characteristic in said brightness circuit is approximately linear over approximately the entire intermediate signal value region and over approximately the entire first portion of the second region", Neitzel teaches in (col. 8, lines 47-48) that a visible image whose density (brightness) is linearly dependent on the output image values A (high signal value). Also, Yamazaki in col. 1, lines 66-67;col. 6, lines 1-46, discloses the threshold setting. Also in Fig. 7, illustrates output characteristic.

11. Claims 24, 10, 11.

The image display unit as set forth in claim 22, wherein a logarithmic value Y(Sa) of said output brightness at said boundary value Sa, a boundary value Sb between said second portion of the second region and said first portion of the second region, and a logarithmic value Y (Sb) of said output brightness at said boundary value Sb are represented by the following equations:

$0.70 \times S_{max} \leq S_b \leq .00 \times S_{max}$

$Y_{max} - 0.25 \leq Y(Sa) \leq Y_{max} - 0.05$

$Y_{max} - 2.15 \leq Y(Sb) \leq Y_{max} - 1.95$

in which Y_{max}, is the maximum value of the logarithmic value of the brightness in said output brightness characteristic. Yamazaki'fig. 11, that shown the output signal vs the input signal, and the limitation from 0-11v requires to activate the luminance and the output signal is increasing exponentially, meaning the input signal at (for example15v) 15v produces the maximum out put signal that is the luminance. Therefore the input signal operates between 11-15v. Neitzel in fig. 2a-e illustrates the maximum and minimum values of the logarithmic value of the out signal.

12. Claim 25.

The image display unit as set forth in claim 23, wherein a logarithmic value Y(Sa) Of said output brightness at said boundary value Sa, a boundary value Sb between said second portion of the second region and said first portion of the second region, and a logarithmic value Y (Sb) of said output brightness at said boundary value Sb are represented by the following equations:

$0.70 \times S_{max} \leq S_b \leq .00 \times S_{max}$

$Y_{max} - 0.25 \leq Y(Sa) \leq Y_{max} - 0.05$

$Y_{max} - 2.15 \leq Y(Sb) \leq Y_{max} - 1.95$

in which Ymax, is the maximum value of the logarithmic value of the brightness in said output brightness characteristic. Yamazaki'fig. 11, that shown the output signal vs the input signal, and the limitation from 0-11v requires to activate the luminance and the output signal is increasing exponentially, meaning the input signal at (for example15v) 15v produces the maximum out put

signal that is the luminance. Therefore the input signal operates between 11-15v. Neitzel in fig. 2a-e illustrates the maximum and minimum values of the logarithmic value of the out signal.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Javid A Amini whose telephone number is 703-605-4248. The examiner can normally be reached on 8-4pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Razavi can be reached on 703-305-4713. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Javid A Amini
Examiner
Art Unit 2672

Javid Amini

PRIMARY EXAMINER